DOCUMENT RESUME

ED 222 468 SP 021 192

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TITLE Teacher Attitude Toward and Student and Teacher Perception of Teaching Style and Achievement.
PUB DATE Aug 82
NOTE 74p.; Doctoral dissertation, Walden University.

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Academic Achievement; Classroom Techniques; Elementary Education; Student Attitudes; Student Characteristics; *Student Evaluation of Teacher Performance; Student Reaction; *Teacher Attitudes; *Teacher Behavior; Teacher Effectiveness; Teaching Methods; *Teaching Styles; Test Construction
IDENTIFIERS Souster Teacher Opinion of Research in Education

ABSTRACT

This study explored the interaction between teacher style and student achievement. A secondary aim of the study was to develop an instrument to rate teacher knowledge and understanding of instructional theory and practice as they affect student achievement. The Student Perception of Teacher Style (SPOTS) scale was administered to 504 sixth-grade students. Dependent variables were achievement test results as measured by the Canadian Test of Basic Skills (CTBS). Students were classified by their perceptions of their teachers' instructional styles and by socioeconomic status. Teachers of the students in the sample were also rated with the Teacher Style Checklist (TSC) scale, and they also completed an instrument constructed for the current study, the Souster Teacher Opinion of Research in Education (STORE) scale. An analysis of variance revealed that students taught by teachers using an indirect instructional style did significantly better on the CTBS language, reading, and mathematics subtests. With further analysis of variance procedures, it was also determined that low socioeconomic groups did significantly better on the CTBS language subtest when their teachers used indirect instructional styles. Teachers who used a combination of direct and and indirect teaching styles had higher group mean scores than either the direct or indirect styles on the STORE scale. This report presents a review of the literature on teaching style and student achievement, information on the construction of the STORE scale, procedure and design of the study, findings and conclusions (including results of the testing of five hypotheses), and discussion and implications of the study. Twenty-eight tables present information gathered from the study. (Author/JD)

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ED222468

TEACHER ATTITUDE TOWARD AND STUDENT AND TEACHER PERCEPTION OF TEACHING STYLE AND ACHIEVEMENT

By

Darrell K. Souster

B.Ed. University of Saskatchewan

M.Ed. University of Saskatchewan, 1975

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Edmonton, Alberta

A Dissertation Submitted in Partial Fulfillment of
The Requirements for the Degree of
Doctor of Philosophy

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To my wife Joan. My straight

man on life's crooked path.

ABSTRACT

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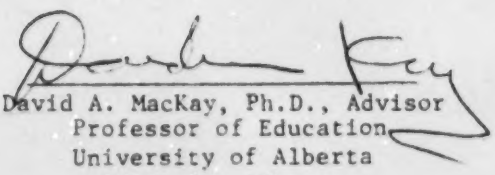

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ABSTRACT

The primary aim of the current investigation was to explore further the interaction between teacher style and student achievement. The secondary aim was to develop an instrument to rate teacher knowledge and understanding of instructional theory and practice as they effect student achievement results. The Student Perception Of Teacher Style (SPOTS) scale was administered to 504 grade six students. The dependent variables were achievement test results as measured by the Canadian Test of Basic Skills (CTBS). Students were classified as to their perception of their teacher's instructional style and by socioeconomic status. Teachers of the sample students were also rated with the Teacher Style Checklist (TSC) scale, and they also completed the instrument constructed in the current study, the Souster Teacher Opinion of Research in Education (STORE) scale. An analysis of variance revealed that students taught by teachers using an indirect instructional style did significantly better on the CTBS language, reading and mathematics subtests. With further analysis of variance procedures it was also determined that low socioeconomic classification groups did significantly better on the CTBS language subtest, when their teachers used indirect instructional style. Teachers who used a combination of direct and indirect teacher styles had higher group mean scores than either the direct or indirect styles on the STORE scale.

ACKNOWLEDGEMENTS

The author wishes to thank his Supervisor, Dr. D.A. MacKay for his assistance and patience and the other members of his Supervisory Committee, Dr.Wm. Green and Dr. B. Andrews, for their time and effort.

The author wishes to dedicate his research to his three special ladies, his wife Joan and their two supportive daughters, Allyson and Kerrie.

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CHAPTER I

THE PROBLEM

In 1884, Currie, a school master commented on the classroom interaction between students and their teachers when he said that "The art of teaching . . . comprehends all the means by which the teacher sustains the attention of his class . . . . The only satisfactory attention is that which is given voluntarily and steadily by all during the entire instruction" (Smyth, 1979, p.7). Recently, Silvernail, a teacher educator and researcher stated:

> In recent years our schools have received renewed criticism by educators and noneducators alike. Many have become alarmed by reports of declining achievement levels in our youth. Studies have revealed a fairly consistent fifteen-year decline in many standard achievement test scores and an increase in national illiteracy rates. These reports, coupled with community tax revolts and the enactment of public spending limitations, suggest that schools are moving into a period of closer scrutiny and reformation. . . . Whatever factor or combination of factors ultimately accounts for the decline, it is abundantly clear that many believe our schools are not doing an adequate job. Thus, it appears especially timely for us, as professional educators, to reexamine the effects of our teaching efforts. (Silvernail, 1979, p.5)

Concern throughout the past century has been expressed by many, and current literature refers to aspects of classroom control by teachers and how well the students achieve. This is shown by a statement by Fedigan were he indicates that there is "a most pressing need to replicate, clarify and extend the results so far obtained", in the area of instructional management, achievement and student perceptions of the process (1980, p.40).

Many approaches or teaching strategies have been attempted. The statement by Berliner and Cahen (1973) indicates the complexity of the problem and cites a few of the many interrelated variables and approach-

es used in research of classroom instruction, when they stated, "The structured-unstructured dimensions of instruction can be thought of as an environment for learning as well as a particular style of teaching, rigid vs flexible, or as a teaching method, lecture vs discussion" (1973, p.75).

Recent research identifies the current descriptors of teaching style as being either direct or indirect instruction, with some teachers using both styles (Peterson, 1979; Rosenshine, 1979; Silvernail, 1979).

Delimitation of the Problem

Teacher-centered or direct instructional style has been recently promoted for use in the elementary schools, by some well known researchers at large teacher training institutions (Brophy and Putnam, 1979; Emmer, Evertson and Anderson, 1979; MacKay, 1979). This study examined teacher attitudes and opinion toward, and student and teacher perception of the full range of teaching styles. Student results under these styles were compared, as measured by the Canadian Test of Basic Skills (CTBS). The results should be examined prior to training new teachers to use only one style. Fedigan (1980) suggests that further research into determining which direct classroom management method will yield the highest levels of student achievement. This study focused on a wider perspective and examined attitudes and perceptions toward the whole range of teaching styles.

Importance of the Problem

Teachers have always had to deal with the achievement of their

students; whether the focus was on reporting to parents or accountability of achievement with school administrators. During the last century, criticism has been directed at teachers concerning the number of students given various grades and/or the number of students failed. To address this problem school administrators brought forward standards of conduct expected in classrooms on the part of students and teachers. Researchers developed many sets of standardized tests and statistics to attempt to explain why schools ought to fail some students.

In 1974 Boorstin described this when he stated, "The new prevalence of statistics and the appetite for statistical community were nowhere more vividly expressed than in the twentieth century American elaboration of techniques for 'measuring intelligence' (1974, p.219). This demand for change and social scientific application directed focus on the process of teaching and training of potential teachers.

The direct instruction style is being promoted by many in reaction to the group type or indirect instruction style that was popular in the late 1960's. It appears to be an over reaction to the indirect instruction style which threatened many teachers in the late 1960's and early 1970's. The best examples of attempts to promote indirect instruction are open classroom buildings which in many cases were never used as planned. Most teachers were never trained to use such a facility and even those who did study how to use the approach found the method not popular with veteran teachers, so many decided not to use the style. Many of the teachers who were trained at the time are now school administrators, instructors or researchers at teacher training institutions. Possibly the over reaction to an in-

direct instruction style is as unfair today, as was its forced use in the open-classroom buildings. The attempt in the late 1960's to develop indirect instruction, was the result of the dissatisfaction of large groups of students with traditional direct instruction. Many school drop-outs accused schools of not preparing them for the real world. Proponents of both direct and indirect instruction began to examine the other from their own perspective. An example of this is the insistence of researchers studying direct versus indirect instruction in using achievement tests which test only content, rather than also including a measure of problem solving. Horowitz (1979) reported that indirect instruction produces a greater number of students having success in problem solving, than does direct instruction. He also reported that most research indicates that indirect style promotes a greater measure of creativity than does direct instruction (Horowitz, 1979).

School systems in Canada have used the CTBS as a measure of achievement for many years. It includes content recall as well as problem solving, and is adjusted periodically for Canadian curriculum changes. An example of these necessary modifications, was the inclusion of metric measure when Canada adopted the metric system of measure. The study examined student results on the CTBS using both direct and indirect instruction, and a combination of both styles.

Classroom teachers very often do not have the opportunity to become aware of current findings in research on instruction. Teacher attitudes towards some of the current findings that involve teacher style, learning environment and student achievement were examined.

Bernstein (1971) reported suggestions for language instruction

of students in the lower socioeconomic classification (SEC) levels. This study compared the variance of CTBS language scores of all the subjects as classified by SEC. The research reported by Bernstein suggests that lower SEC subjects operate with a restricted code of language usage. Secondly, this study compared the effects of the three teaching styles on achievement results of the various SEC groups. The Souster Teacher Opinion of Research in Education (STORE) scale determined teacher attitudes toward the findings of Bernstein, Horowitz, Silvernail and other recently reported research.

The results of the study might direct others to consider a statement by an educator who subscribed to both direct and indirect instructional styles, when he wrote:

> Teaching is not like inducing a chemical reaction: it is much more like painting a picture or making a piece of music, or on a lower level like planting a garden or writing a friendly letter. You must throw your heart into it, you must realize that it cannot all be done by formulas, or you will spoil your work, and your pupils and yourself. (Highet, 1958, p. viii)

Hypotheses

1. There will be no significant difference between CTBS results of students who perceive their teacher as using direct instruction, indirect instruction or a combination of both styles as classified by the Student Perception Of Teacher Style scale.
2. There will be no significant difference in CTBS results between students taught by teachers who are perceived as using direct instruction, indirect instruction or a combination of both styles as rated by other teachers using the Teacher Style Checklist scale.

3. There will be no significant difference in Canadian Test of Basic Skills language subtest results, when subjects are compared by socioeconomic classification as determined by the Blishen scale and perceived teacher style, as classified by the Student Perception Of Teacher Style scale.
4. There will be significantly different mean comparisons of student groups on Canadian Test of Basic Skills language subtest results for low socioeconomic subjects as classified by perceived teacher style as either direct or indirect on the Student Perception Of Teacher Style scale.
5. There will be no significant difference in the Souster Teacher Opinion of Research in Education scale results, of teachers who are perceived as using direct instruction, indirect instruction or a combination of both styles on the Student Perception Of Teacher Style scale.
6. There will be no significant difference in the Souster Teacher Opinion of Research in Education scale results of classroom teachers, pupil services teachers or school administrators.

Basic Assumptions

1. Student achievement as measured by the Canadian Test of Basic Skills can be improved by effectve classroom instruction.
2. A student perception of teaching style rating scale is a valid and reliable method for collecting data for this study.
3. A teacher style checklist is a valid and reliable method of collecting data for this study.
4. Teacher opinions toward research results are important to school instruction and should be investigated.

CHAPTER II

REVIEW OF THE LITERATURE

Comparative studies of teaching styles are designed to show the advantages of one instructional method over another. Some writers (Highet, 1958; Anderson, 1959) stated that findings were not conclusive in supporting any one set of methods of instruction. To cope with these difficulties some researchers began to examine the methodology in an attempt to determine the variables which could pin-point the average strength of one style over another. These were generally focused on the main effects (Dubin and Taveggia, 1968), specifically the identified characteristics of competency-based studies.

Recently researchers have been attempting to establish interactions between student characteristics and instructional approaches, this being termed aptitude-treatment interaction (ATI) research . It combines experimental and comparative approaches of examining teaching styles and certain student aptitudes (Cronbach and Snow, 1977).

The literature review for this study examined instructional style, achievement results as measured by the Canadian Test of Basic Skills (CTBS), ratings of teacher style and teacher attitudes toward instructional style and student achievement.

A variety of terms have been used to label teaching style. The polarization of these terms is aptly described by Berliner and Cahan (1973), when they state :

> We include under the headings "structured" didactic, inflexible, conforming, lecture-method and other structured approaches to instruction. Under the heading "unstructured" we include student-centered, flexible, independent study, discussion-method and similar approaches to instruction. (p. 73)

Current teaching style labels are explained by Peterson (1979) when she states "we seem to be traversing the same old avenue again, only this time the teacher-centered or directive method is called"direct instruction" and the other method is referred to as "open","indirect", or "non-traditional" approach" (p. 58).

Rosenshine (1979) reviewed literature on instructional style, and strongly suggests that direct instruction is a superior method for elementary students. Peterson (1979) states that Rosenshine's review considers "only several of the many studies comparing open and traditional teaching, however, and a closer and a more exhaustive survey of the literature suggests that such a conclusion may be simplistic . . . direct instruction may be effective for some kinds of students, but not for others" (p. 58). Peterson (1977) studied direct and indirect instruction and found no significant differences in student achievement in social studies. Everest (1975) found no significant difference in student achievement in mathematics using both direct and indirect instruction. Hollis (1976) examined the effects of direct versus indirect instruction with third grade students' locus of control and found no statistical difference.

Silvernail (1979) did an exhaustive review of instructional literature and found that both positive and negative relationships between teacher style and pupil achievement were the case with both direct and indirect instruction. He reported that in his opinion only a combination of direct and indirect instruction would yield a positive relationship with pupil achievement (Silvernail, 1979, p. 10). In 1977, the California State Department of Education reported that teachers, in matched social and demographic schools, with higher-achieving stu-

dents were more task orientated, than those with lower-achieving students. Brophy and Evertson (1974) stated that successful teachers were determined that their students would learn. The studies reported thus far show the proliferation of findings concerning teacher styles and student achievement.

The current study has examined the attitudes of teachers toward research on classroom instruction and pupil achievement. Secondly, as mentioned in chapter one, the study compared the achievement of sixth grade students who identified the instructional style of their teacher. The following review refers to student perception of teacher style and the use of the CTBS as an achievement test in research.

Froese (1971) used the CTBS as an achievement test instrument with grade six students, and reported acceptable validity and reliability values. MacIntyre (1980) also used the CTBS as one of many instruments in a study involving learning disabilities. MacIntyre reported the CTBS as being an acceptable research instrument to test achievement of Canadian students.

The Student Perception Of Teacher Style (SPOTS) scale was developed by Tuckman (1968), for use in his own research. He reported that students preferred indirect instruction, and also earned higher grades in school under the indirect style (1968). The SPOTS has been used by others as a means of student classification of teacher style (Gardner and Taylor, 1980; Saklofske, 1980; and Kebernik, 1980). A massive study was done in 1976 by Stoltman, when he used student perception of teacher style to assess student views from around the world. In the study he also used a set of attitude scales comparing student subjects from

England, Cyprus, Canada, Nigeria Hong Kong and the United States.

The opinions of teachers towards educational research findings was investigated in this study. Cantrell (1977) and Lockheed (1977) both reported that teacher expectations of students, can have a substantial impact on student achievement. Barth (1978) and Burstall (1978) both examined the opinions, attitudes and behaviors of classroom teachers, and indicated that teacher opinion toward the teaching process does affect performance. Cooper (1979) developed a model to depict the effects of teacher expectations on student performance. Clements (1980) studied the relationship of teacher perceptions of classroom processes and student outcomes. Clements stated that teacher opinions could be useful in predicting teacher behavior and management effectiveness in the classroom.

Bernstein (1971) reported that students from low socioeconomic segments of the school population, operate with a restricted code of language usage. He reported that students from higher socioeconomic levels use a more elaborate code of language usage. Bernstein suggested that a teacher who uses a more open and discussion centered teaching style will be more successful in helping low socioeconomic classification (SEC) students attain greater success in language usage (1977). Fedigan and Gay (1979) in a literature review, report an interaction between teacher style and SEC. The interaction may be as Bernstein indicated, between indirect instruction and SEC, however Fedigan and Gay were reported by Kratzmann, Byrne and Worth (1980) as having found :

> Direct instruction is reported to be more effective with pupils from low socioeconomic backgrounds; indirect instruction more effective with pupils of high socioeconomic families.(1980,p.86)

The previous statement from Kratzmann, Byrne and Worth (1980), was made in a report to the Alberta Minister of Labour, as part of their findings as a fact finding commission. This commission and the findings are a part of the concern by the Government of Alberta, with the whole area of classroom instruction and student achievement. The Alberta Department of Education has released a document expressing concern in the area of school instruction and student achievement (Bumbarger and Friesen, 1977). In 1980, the Alberta Minister of Education made a statement in the Alberta Legislature regarding student achievement, which emphasizes the concern in Alberta :

> Selected achievement tests in the subjects mentioned (language arts, social studies, mathematics and sciences) will be administered annually. These tests are intended to monitor the effectiveness of the curriculum relative to the standards and quality of student achievement. (King, 1980, p.3)

CHAPTER III

CONSTRUCTION OF THE SOUSTER TEACHER OPINION OF RESEARCH IN EDUCATION (STORE) SCALE

Item Preparation

Literature concerning teaching style, academic achievement and learning environment has been reviewed by Horowitz (1979) and Silvernail (1979). The items of the Souster Teacher Opinion of Research in Education (STORE) Scale were developed from the consensus of findings reported in the reviews by Horowitz and Silvernail. Each item was structured to allow for choice between agreement with research findings, disagreement, an uncertain response and a don't know response. For example,

> Indirect instruction will facilitate greater student success in problem solving.
>
> A. agree
> B. disagree
> C. uncertain
> D. don't know

A pool of 70 items of the above type were prepared.

Content Validity

The 70 items were submitted to ten teachers who have completed graduate courses in the past four years. They were asked to use their knowledge of instructional research and their teaching experience to judge the clarity of items. The items all were statements from research reviews as previously mentioned, and the judges were to reject any unclear or ambiguous statements. An initial version of the STORE was then prepared from those items the ten teachers rated to be most content specific. There were 30 items in the first version, with 15 requiring a response of 'agree' and 15 requiring a

response of 'disagree' to be correctly answered. Appendix A contains a copy of the initial 30 item STORE Scale. Appendix B contains the final 20 item STORE Scale, with Appendix C being the'Guide for scoring the 20 item STORE Scale'.

Item Analysis Procedure

The initial 30 item version of the STORE Scale was administered to 120 teachers selected at random from the County of Strathcona Board of Education at Sherwood Park, Alberta. The sample included both elementary and secondary school teachers as well as school counsellors, special education teachers and school administrators. The result of an item-total correlational analysis performed on the responses to individual items by these subjects are shown in Table 1.

Final Item Selection

The criteria used to select the 20 items for the final version of the test was an item-total correlation between the .35 and the .69 range. The rationale behind this criteria is well established (eg. Cattell, 1965; Nunnally, 1967; Borg and Gall, 1979). In attempting to include a variety of aspects affecting the effectiveness of classroom instruction, both teaching styles and communication approaches were considered in the content. Situations involving direct instruction, indirect instruction and a combination of both were included as items. However a broad range of correlations of items with the total would be justified. For example, item 3 on the initial version of the test involves a minor judgement in the area of teaching style. Specifically, it was designed to test the level of subjects. Therefore, it should correlate rather minimally with the total test. Table 1 shows a cor-

TABLE 1

ITEM-TOTAL CORRELATIONS FOR THE

30-ITEM INITIAL STORE

ITEM NUMBER	ITEM-TOTAL r.	ITEM NUMBER	ITEM-TOTAL r.
1	.321	16	.334
2	.000	17	.686
3	.185	18	.564
4	.211	19	.249
5	.598	20	.454
6	.651	21	.386
7	.322	22	.393
8	.207	23	.543
9	.059	24	.467
10	.420	25	.380
11	.000	26	.420
12	.432	27	.575
13	.549	28	.435
14	.420	29	.480
15	.677	30	.576

N= 120

relation of .185 for item 3 of the total 30 item STORE.

Item 30-3 Teachers who have taught in "open area" type schools, support the concept for use with the majority of students.

Conversely, an item such as item 17 on the initial version, deals with an extreme statement of teaching style, and therefore should correlate with the total test to a greater extent. Item 17 was designed to elicit a forced statement as to the results of application of a specific teaching style. The correlation of this item with the test was .686. Both the application of knowledge from practice as a teacher and knowledge of theory of instruction was implicit in item 17, therefore the high correlation is most acceptable.

Item 30-17 Problem solving success is stimulated more by a direct rather than an indirect instructional style.

The Final 20-Item STORE Scale

The final 20-item version of the STORE Scale (see Appendix B) was prepared and administered to the 162 subjects representing the groups listed in Table 2 below.

TABLE 2

DISTRIBUTION OF SUBJECTS FOR THE

FINAL STORE ITEM-TOTAL CORRELATION STUDY

GROUP	NUMBER IN SAMPLE
Classroom teachers	54
Pupil services teachers	54
School administrators	54
TOTAL	162

TABLE 3

ITEM-TOTAL CORRELATIONS FOR THE FINAL

20-ITEM VERSION OF THE STORE

ITEM NUMBER	ITEM-TOTAL r.	ITEM NUMBER	ITEM-TOTAL r.
1	.561	11	.454
2	.437	12	.564
3	.435	13	.682
4	.575	14	.653
5	.414	15	.420
6	.380	16	.549
7	.457	17	.432
8	.543	18	.420
9	.393	19	.651
10	.386	20	.587

All items fell within the range of the item-total correlation limits previously established.

Validity Considerations

The content validity of the instrument was established:

1. through adherence to the specific content reviewed by Silvernail (1979) and Horowitz (1979).
2. through acceptance only, of the items which were rated as clear and logical by ten practicing teachers.
3. through the use of item-total correlational analysis.

The construct validity (which will be discussed at length in succeeding chapters) was established through the comparison of scores obtained by criterion groups (e.g. School Administrators, Pupil Services Teachers, Classroom Teachers).

Hypothesis Number Six dealt with the differences between three groups on the STORE Scale, namely classroom teachers, pupil services teachers (school counsellors and special education teachers) and school administrators. This hypothesis was tested for significant differences in the three groups results, because it was suspected by the writer that pupil services teachers would do better than classroom teachers on the STORE. Most pupil services teachers in the employ of the County of Strathcona Board of Education have completed graduate courses in either educational psychology or special education. It was assumed that they would score higher on the STORE because of their specialized training. It was also assumed that school administrators would score lower as a group than classroom teachers, because of the specialized nature of their graduate work. Generally, school administrators in the County of Strathcona must take graduate work in educational administration. These courses deal more with the

administration of schools, rather than instructional techniques.

Reliability Estimates

The subjects listed in Table 4 were drawn from the three groups, and were tested and retested during a five week interval.

TABLE 4

SUBJECTS PARTICIPATING IN THE TEST-RETEST CONSISTENCY STUDY

GROUP	NUMBER IN SAMPLE
Special Education Teachers	19
School Counsellors	18
Classroom Teachers	67
TOTAL	104

The estimate of reliability obtained by this procedure was .916. A further estimate of reliability was derived by determining odd-even correlations and by using the Spearman-Brown formula. This latter procedure yielded an estimate of .91. The N was 162 and consisted of those groups listed in Table 2.

CHAPTER IV

PROCEDURE AND DESIGN

In this chapter the procedures used in collecting the data for the investigation are discussed under the headings of the Subjects, Instruments and Testing Procedures.

SUBJECTS

Several populations were sampled in this study. Information relevant to samples, numbers of subjects and the specific tests each group completed, is provided in Table 5.

TABLE 5

DESCRIPTION OF SUBJECTS AND TESTS ADMINISTERED

SAMPLE	N	TEST(S)
Grade Six Students	504	SPOTS, CTBS*
Classroom Teachers	50	STORE
Pupil Services Teachers	50	STORE
School Administrators	50	STORE
TOTAL	654	

* All subjects in this group did not complete the CTBS

The first part of this study was conducted in Sherwood Park, Alberta, and included all the grade six students in the schools under the County of Strathcona Board of Education in Sherwood Park. The

teachers of these students were also included in the study. The population contained 504 students, and the sample student groups were selected at random as follows. The population was given Tuckman's Student Perception Of Teacher Style Scale, and a sample of 55 students from each sex and teacher style was randomly selected as shown in Table 6.

TABLE 6

CELLS OF THE STUDENT STUDY AS RANDOMLY ASSIGNED BY SEX AND STUDENT PERCEPTION OF TEACHER STYLE

GROUPS	N
Boys Direct Style	55
Boys Indirect Style	55
Boys Both Styles	55
Girls Direct Style	55
Girls Indirect Style	55
Girls Both Styles	55
TOTAL	330

In the second part of the study the teachers of the students selected in Table 6 were therefore rated as to their teaching style by their students. Secondly, they were rated by an observer using the Teacher Style Checklist (Tuckman, 1968). These teachers also completed the STORE Scale.

The third part of the study involved the testing of the STORE Scale with criterion groups. A random sample of professional teaching staff was selected from the County of Strathcona Board of Education. Fifty subjects were selected from each of three groups; classroom teachers, pupils services teachers and school administrators. The three groups were all administered the STORE Scale.

INSTRUMENTS

Student Perception Of Teacher Style (SPOTS) Scale (revised)

The SPOTS Scale was developed by Tuckman (1968) as it was needed for his investigation of the relationship between teacher style and student characteristics. Tuckman reported that the scale could be used to rate teaching style without using raters or observers. The SPOTS is reported as having an ordinal scale and can be analysed with statistical techniques. The revised SPOTS is a scale which has been tested for reliability with ratings by judges of teacher style, and a correlation reported at between .69 and .95 on separate analysis of differing groups studied.

The revised SPOTS Scale was designed to measure the teaching style as observed by students and was constructed from an original 32 item scale. Tuckman reported that the original 32 item scale was reduced to a more compact, internally consistent measure of teaching style.

Factor analysis resulted in seven factors consisting of 13 items which indicated an "authoritarian-traditional-orientation" of teacher directiveness. These 13 items had significant correlations with the total SPOTS. Tuckman added four other items from the original SPOTS,

which also correlated highly with the original SPOTS full scale, to develop the revised SPOTS Scale. He reported that the SPOTS was worthy to be used in future research as an alternative to his Observer Rating Scale (ORS):

> Overall, the SPOTS appeared to satisfy the five criteria suggested by Remmers (1963) for judging the adequacy of student rating scales. The scale showed (a) objectivity, it yielded verifiable and reproducible data; (b) reliability, it was consistent over judges; (c) sensitivity, it discriminated between teachers and teaching styles; (d) relevence, it was related to the construct of directiveness (as evidenced by its relation to the ORS and further strengthened by the factor analysis), (e) utility,it was high in efficiency and practicality.(Tuckman, 1968, p.65)

Canadian Tests of Basic Skills (CTBS), Form Three M

The CTBS was used as a measure of academic achievement, in the subjects of reading, language and mathemetics. The CTBS is actually the Iowa Tests of Basic Skills, but with Canadian norms and revisions for Canadian curriculum as changes are made by the Departments of Education in Canadian provinces. The test is edited by King, of the University of Calgary, under the supervision of Linquist and Hieronymus, authors of the Iowa Tests of Basic Skills. The procedure to be followed in administering the test is outlined in the Manual for Administration (King, 1977). The reliability coefficients for the tests are reported as follows; reading at .93, mathematics at .91 and language at .91.

Teacher Style Checklist (TSC)

Tuckman (1968) devised this checklist to be used as a simple method to judge teaching style, as either direct, indirect or a combination of both. This checklist is for use by other teachers as judges of each item. The TSC has a reliability of .88 when results

are compared to Tuckman's Observer Rating Scale (ORS). The ORS is a detailed teacher observation process which uses many visits to a classroom by trained observers of teaching style (Tuckman, 1968, p.92). The ORS was reported to have an inter-rater reliability coefficient of .81. The TSC was reported to have an inter-rater reliability coefficient of .77.

Blishen Occupational Class Scale

Blishen (1958) developed a scale which established a Socioeconomic Classification (SEC) for subjects according to the parents' occupation and years of training beyond high school. He designed the scale with three approximately equal groupings: high, average and low. Each student subject in the study was placed in one of the three groups following the procedure outlined by Blishen (1958).

Souster Teacher Opinion of Research in Education (STORE)

The STORE Scale was developed in this study. The opinion of practicing teachers toward reported research in the area of teaching style and student achievement delimits the scope of the scale.

The reliability coefficients for the STORE Scale are as follows: the test-retest reliability is reported at .916, while the split-half reliability is reported at .91.

TESTING PROCEDURES

The study used the methodology of aptitude-treatment interaction research. It combines experimental and correlational approaches of investigating instructional methods and aptitudes (Cronbach and Snow, 1977). Teaching styles were analysed with CTBS results, from reading, language and mathematics subtests, using an analysis of variance procedure (Winer, 1971).

All tests were administered in the manner prescribed by the test manuals or as described in the discussion concerning the instrument. Socioeconomic classifications of students, and classification of teachers were completed as described in the discussion concerning the instruments. The test results were then entered on data cards. Subsequently, computer calculations were made consisting largely of item analysis, correlations, analysis of variance and mean comparisons.

CHAPTER V

FINDINGS AND CONCLUSIONS

Analysis and discussion of the results in the study are reported in the sequence of the originally stated hypotheses. Each hypothesis is restated, followed by its related findings and conclusions.

HYPOTHESIS NUMBER ONE

> There will be no significant difference between CTBS results of students who perceive their teacher as using direct instruction, indirect instruction or a combination of both styles as classified by the Student Perception Of Teacher Style Scale.

Findings

Three separate analysis of variance procedures were used to test this hypothesis (Overall and Spiegal, 1969). The three tables referred to below all report results analysed with the classification of student achievement data into groups by their teacher's instructional style as determined by the SPOTS Scale. Table 7 reports the analysis described, with CTBS language stanine scores. Table 9 reports the CTBS reading stanine scores using the above described analysis. Table 11 reports the analysis described, with CTBS mathematics stanine scores. Mean comparisons for significant levels reported in the three above mentioned tables, are reported as follows: Table 8 for language scores, Table 10 for reading scores and Table 12 for mathematics scores.

Analysis of the data using the Scheffé Test of mean comparisons to test for significantly different means was completed (Scheffe,1959). The mean and standard deviation for each cell is reported in Table 13.

Hypothesis number one was rejected. Teacher style groups as rated by students on the SPOTS Scale were all significantly different as reported in Tables 7, 9 and 11 (language scores, p= .0209; reading

scores, p= .0022; mathematics, p= .0011).

Mean comparisons of CTBS language scores for teacher style groups were found to be significantly different between direct and indirect instructional style groups, as reported in Table 8. Mean comparisons of CTBS reading and mathematics scores were significantly different for all instructional style group comparisons, as reported in Tables 10 and 12.

TABLE 7

ANALYSIS OF VARIANCE OF CTBS LANGUAGE STANINE SCORES AS COMPARED BY TEACHER STYLE

SOURCE	MS	df	F-ratio	P
Between	7.55	2	3.91	.0209*
Within	1.93	327		

* $p < .05$

TABLE 8

MEAN PAIR COMPARISON MATRIX OF TEACHER STYLE ON CTBS LANGUAGE STANINE SCORES

MEAN		Direct	Both	Indirect
6.1589	Direct			
6.4018	Both			
6.6847	Indirect	*		

* $p < .1$ (Scheffé Test)

TABLE 9

ANALYSIS OF VARIANCE OF CTBS READING STANINE SCORES AS COMPARED BY TEACHER STYLE

SOURCE	MS	df	F-ratio	P
Between	12.17	2	6.23	.0022 *
Within	1.95	327		

* $p < .01$

TABLE 10

MEAN PAIR COMPARISON MATRIX OF TEACHER STYLE ON CTBS READING STANINE SCORES

MEAN		Direct	Both	Indirect
5.7664	Direct			
6.2946	Both	*		
6.3874	Indirect	*		

* $p < .1$ (Scheffé Test)

TABLE 11

ANALYSIS OF VARIANCE OF CTBS MATHEMATICS STANINE SCORES AS COMPARED BY TEACHER STYLE

SOURCE	MS	df	F-ratio	P
Between	15.37	2	6.99	.0011 *
Within	2.20	327		

* $p < .01$

TABLE 12

MEAN PAIR COMPARISON MATRIX OF TEACHER STYLE ON CTBS MATHEMATICS STANINE SCORES

MEAN		Direct	Both	Indirect
5.7196	Direct			
6.2411	Both	*		
6.4504	Indirect	*		

* $p < .1$ (Scheffé Test)

TABLE 13

CTBS STANINE MEANS AND STANDARD DEVIATIONS FOR STUDENTS GROUPED BY TEACHER STYLE AS RATED BY STUDENTS

TEACHER STYLE	N		CTBS LANGUAGE	CTBS READING	CTBS MATHEMATICS
Direct	107	$\bar{X}$	6.1589	5.7664	5.7196
		SD	1.4547	1.5146	1.5709
Both	112	$\bar{X}$	6.4018	6.2946	6.2411
		SD	1.3653	1.3399	1.4596
Indirect	111	$\bar{X}$	6.6847	6.3874	6.4504
		SD	1.3483	1.3360	1.4190

Conclusions

Student achievement as measured by the CTBS in the areas of language, mathematics and reading, was significantly higher in the group taught by teachers rated by their students as using an indirect style of teaching. In all three parts of the analysis, Table 7, 9 and 11,we find significantly different means, with indirect style highest with all subtests.

HYPOTHESIS NUMBER TWO

There will be no significant difference in CTBS results between students taught by teachers who are perceived as using direct instruction, indirect instruction or a combination of both styles, as rated by other teachers using the Teaching Style Checklist Scale.

Findings

Three separate analysis of variance were used to test this hypothesis. Tables listed later report the results as analysed with the

classification of student achievement data into groups by their teacher's instructional style as determined by teacher raters using the TSC. Table 14 reports the analysis of variance with CTBS language stanine scores, while Table 16 reports the CTBS reading scores analysis, and finally Table 18 reports the CTBS Mathematics scores analysis.

Hypothesis number two was rejected. Teaching style as rated by independent teacher raters on the TSC is shown in the analysis of variance, reported in Table 16 and Table 18 as being significantly different (reading scores, p= .0037; mathematics scores, p= .0019).

The CTBS language scores as reported in Table 14, in an analysis of variance, were not significantly different, with a p= .0530. However in the Scheffe mean comparisons from Table 16, student scores under the indirect teaching style as rated by teachers, were significantly different from direct teaching style group means. It is suspected that the p= .0530 for all three instructional groups was found because the group using both styles, was not significantly different.

Analysis of the data using the Scheffé Test of mean comparisons to test for significant differences, is presented in Table 15 (CTBS language), Table 17 (CTBS reading) and Table 19 (CTBS mathematics) (Scheffé, 1959).

TABLE 14

ANALYSIS OF VARIANCE OF CTBS LANGUAGE STANINE SCORES AS COMPARED BY TSC GROUP

SOURCE	MS	df	F-ratio	P
Between	5.75	2	2.96	.05
Within	1.94	327		

TABLE 15

MEAN PAIR COMPARISON MATRIX OF TSC

GROUPS BY CTBS LANGUAGE STANINES

MEAN		Direct	Both	Indirect
6.2520	Direct			
6.3462	Both			
6.6893	Indirect	*		

* $p < .1$ (Scheffé Test)

TABLE 16

ANALYSIS OF VARIANCE OF CTBS READING STANINE

SCORES AS COMPARED BY TSC GROUP

SOURCE	MS	df	F-ratio	P
Between	11.19	2	5.71	.0037 *
Within	1.96	327		

* $p < .01$

TABLE 17

MEAN PAIR COMPARISON MATRIX OF TSC

GROUPS BY CTBS READING STANINES

MEAN		Direct	Both	Indirect
5.9024	Direct			
6.0865	Both			
6.5243	Indirect	*	*	

* $p < .1$ (Scheffé Test)

TABLE 18

ANALYSIS OF VARIANCE OF CTBS MATHEMATICS STANINE

SCORES AS COMPARED BY TSC GROUP

SOURCE	MS	df	F-ratio	P
Between	14.05	2	6.36	.0019 *
Within	2.21	327		

* $p < .01$

TABLE 19

MEAN PAIR COMPARISON MATRIX OF TSC GROUPS

ON CTBS MATHEMATICS STANINE SCORES

MEAN		Direct	Both	Indirect
5.7805	Direct			
6.2500	Both	*		
6.4660	Indirect	*		

* p < .1 (Scheffé Test)

TABLE 20

ANALYSIS OF VARIANCE OF CTBS LANGUAGE STANINE SCORES

AS COMPARED BY SEC AND TEACHER STYLE ON THE SPOTS

SOURCE	MS	df	F-ratio	P
Main Effects	21.68	4	12.56	.0001 **
SEC	35.80	2	20.74	.0001 **
Style	7.81	2	4.52	.0120 *
Interaction	1.35	4	0.78	.5370
Explained	11.52	8	6.67	.0001 **
Residual	1.73	321		
Total	1.96	329		

* p < .05 ** p < .01

The mean and standard deviation for each cell is reported in Table 21. The mean comparisons of CTBS language scores for teacher style groups were found to be significantly different between indirect and direct groups as reported in Table 15. Mean comparisons of CTBS mathematics scores for teacher style groups were found to be significantly different between all groups, as reported in Table 19. The mean comparisons done with CTBS reading scores between teacher style groups found significant were between indirect instructional style and the other two classifications, as reported in Table 17.

Conclusions

Student achievement as measured by the CTBS in the areas of language, mathematics and reading, was significantly higher in groups taught by teachers using an indirect style, as was found on all parts of the analysis (Tables 16, 18 and 20). It should also be noted that on mean comparisons using reading and mathematics scores, even though the indirect teaching style yielded the highest achievement group means, that also a combination of both styles also produced significantly higher group results than did the direct style in mathematics.

HYPOTHESIS NUMBER THREE

> There will be no significant difference in CTBS language results when subjects are compared by socioeconomic classification on the Blishen Occupational Scale and perceived teaching style as classified by the Student Perception Of Teacher Style Scale.

Findings

A analysis of variance using CTBS language scores and comparing means of students grouped by SEC and SPOTS is reported in Table 20. The interaction between SEC and teacher style was not significant and therefore Hypothesis Number Three was accepted.

TABLE 21

CTBS STANINE MEANS AND STANDARD DEVIATIONS FOR STUDENTS GROUPED BY TEACHER STYLE ON THE TSC

TEACHER STYLE	N		CTBS Language	CTBS Reading	CTBS Mathematics
Direct	123	$\bar{X}$	6.2520	5.9024	5.7805
		SD	1.4119	1.5280	1.6223
Both	104	$\bar{X}$	6.3462	6.0865	6.2500
		SD	1.3565	1.2855	1.3847
Indirect	103	$\bar{X}$	6.6893	6.5243	6.4660
		SD	1.4075	1.3482	1.4129

TABLE 22

STANINE MEANS FOR STUDENTS GROUPED BY SEC CLASSIFICATION ON THE CTBS

SEC	N	CTBS Language	CTBS Reading	CTBS Mathematics
High	112	7.01	6.98	6.88
Average	109	6.35	5.95	6.02
Low	109	5.88	5.50	5.50

Conclusions

The acceptance of this hypothesis indicates that teacher style and SEC group cells, as reported in Table 23, when all considered, are not significantly different. However as shown in Table 20, when student CTBS language scores are separated into groups by SEC, the groups are significantly different (p=.0001). Secondly, when using teacher style to separate the CTBS language scores into groups, significance is also found (p=.012).

HYPOTHESIS NUMBER FOUR

> There will be significantly different mean comparisons of student groups on CTBS language subtest results for low socioeconomic subjects as classified by perceived teacher style as either direct or indirect on the Student Perception Of Teacher Style Scale.

Findings

Hypothesis number four was accepted, as shown in Table 24, as the difference between low socioeconomic student groups taught by directive or indirective teachers was significant. There was no significant difference found when a combination of both styles was used with low SEC students in language.

Conclusions

Students from the low socioeconomic classification, who had teachers using an indirect style, scored significantly better on the language achievement test than students taught by teachers using a direct style. It should be noted that this analysis was completed for low SEC student groups only.

TABLE 23

MATRIX OF CTBS LANGUAGE STANINE SCORE MEANS AS CLASSIFIED BY SEC AND SPOTS RATING GROUPS

SEC	TEACHER STYLE		
	Direct	Both	Indirect
Low	5.58	5.87	6.16
Average	6.02	6.54	6.58
High	6.97	6.76	7.37

TABLE 24

CTBS LANGUAGE STANINE MEAN COMPARISON MATRIX OF LOW SOCIOECONOMIC STUDENTS COMPARED BY SPOTS GROUP ASSIGNMENT

MEAN		Direct	Both	Indirect
5.58	Direct			
5.87	Both			
6.16	Indirect	*		

* $p < .1$ (Scheffé Test)

HYPOTHESIS NUMBER FIVE

There will be no significant difference in the Souster Teacher Opinion of Research in Education Scale results of teachers who are perceived as using direct instruction, indirect instruction or a combination of both styles, by their students on the Student Perception Of Teacher Style Scale.

Findings

Hypothesis number five was accepted as the analysis of variance indicated no significant difference between teacher groups on the STORE Scale ($p = .1062$), as reported in Table 25.

Conclusions

It is assumed that the similarity in means of the three teacher groups is a result of test construction which included an item-total correlation to eliminate items which may cause variation. It was also assumed that professional teachers would score consistently high on theory of instruction and variables that effect student achievement. Even though no significantly different means were found, the teacher group which used a combination of both direct and indirect instruction had a mean difference of 1.7647 and 1.4685 respectively with the other two groups. The directive and indirective groups show a mean difference of only 0.3162.

The teachers who used a combination of teacher styles knew more about instructional theory as presented by the STORE Scale, than the other two groups, and they also had better success teaching their students than directive teachers, as reported in Table 13.

TABLE 25

ANALYSIS OF VARIANCE OF TEACHER SCORES ON THE STORE SCALE COMPARED BY SPOTS CLASSIFICATION

SOURCE	MS	df	F-ratio	P
Between	14.98	2	2.353	.1062
Within	6.67	47		

(no significance found)

TABLE 26

STORE SCALE RAW SCORE MEAN DIFFERENCES MATRIX OF TEACHERS GROUPED BY THE SPOTS SCALE

MEAN		Direct	Both	Indirect
12.0588	Direct			
13.8235	Both	1.7647		
12.3750	Indirect	0.3162	1.4685	

(Scheffé Test found no significant differences)

HYPOTHESIS NUMBER SIX

There will be no significant difference in the Souster Teacher Opinion of Research in Education Scale results of classroom teachers, pupil services teachers and school administrators.

Findings

Hypothesis number six was accepted, as the analysis of variance indicated no significant difference between teacher groups on the STORE Scale (p= .1281), as reported in Table 27.

TABLE 27

ANALYSIS OF VARIANCE OF TEACHER SCORES ON THE STORE SCALE COMPARED BY TYPE OF TEACHING POSITION

SOURCE	MS	df	F-ratio	P
Between	16.45	2	2.084	.1281
Within	7.89			

(no significance found)

Conclusions

It is assumed that the similarity in means of the three teacher groups is a result of the item-total correlation process, which eliminates items which may cause variation. Also as previously mentioned, all teachers were expected to score highly on the STORE which contains items that deal with instructional theory. Even though no significantly different means were found, the pupil services teachers (counsellors and special education teachers) had a mean difference of 1.14

with school administrators, as reported in Table 28. The pupil services teachers had a mean difference of 0.68 with classroom teachers also, establishing a pattern of having higher means than other groups on the STORE. The pupil services teachers were therefore found to score higher on items that indicate a knowledge of teaching practices which improve student achievement. School administrators were found to score the lowest on these items.

TABLE 28

STORE SCALE RAW SCORE MEAN DIFFERENCES MATRIX OF TEACHERS GROUPED BY THEIR TEACHING POSITION

MEAN		School Administrators	Classroom Teachers	Pupil Services Teachers
12.30	School Administrators			
12.76	Classroom Teachers	0.46		
13.44	Pupil Services Teachers	1.14	0.68	

(Scheffé Test found no significant mean comparisons)

CHAPTER IV

DISCUSSION AND IMPLICATIONS

DISCUSSION

Student achievement and teaching style have been the topic of much research and discussion. The review of the literature in this study attempted to emphasize the variety of theory and findings that surround these two aspects of classroom instruction. Domino (1968 , 1971) conducted two investigations concerning the relationship between teacher style and achievement orientation. Lunn (1971) also conducted two investigations in England related to student achievement and the relationship of SEC and student attitudes toward doing well in school.

Tuckman (1968), as mentioned earlier in this study, completed a two part study concerning teacher style. Firstly, it involved the construction and validation of two instruments, one for rating teacher style through classroom visitation. His second instrument was for students to complete and in doing so, rate their teacher's instuctional style. Tuckman also assessed student attitudes toward their preference of instructional style, and found indirect style generally preferred. Bernstein (1971) also discussed teacher style and socioeconomic classification as they effect achievement in language. His theories were discussed in the review of literature in this study.

In an attempt to deal with public concern over achievement levels and standards in schools, the Alberta Department of Education has set itself on a course which will develop provincial achievement tests and standards. The Minister of Education for Alberta announced in November

of 1980 that "The Government of Alberta has now developed a policy for evaluatiom of student achievement in Alberta" (King, 1980). As a small part of the preparation for such a task, the same department had a review of the literature in the area of student achievement completed. The researchers reporting part of that review, Fedigan and Gay (1979) stated that 'direct' instruction is reported to be more effective with students from the lower levels of socioeconomic classifications. They continued to say that 'indirect' instruction is more effective with high socioeconomic classification students (Fedigan and Gay, 1979).

The theories of Bernstein (1971), reported in the literature review of this study, indicate that low SEC students show greatest achievement gains under a type of instruction such as the 'open' or 'indirect' style. He says that this will nurture and foster an elaborate code of language usage, rather than the restricted code that low SEC students demonstrate as a characteristic of the group (Bernstein, 1971).

This study is an attempt to examine some of the findings and theories mentioned above by applying the dimensions of teaching style, student achievement and methods that promote better student achievement. The SPOTS and the TSC developed by Tuckman (1968) were used in this study. These instruments sort students into groups by teacher style and as a part of a larger process, significant findings evolved. Using both scales, students in the areas of language, reading and mathematics, did significantly better as a group when taught by indirect teacher style. Secondly with teachers judged to use a combination of direct and indirect style, it was found that their students also

scored significantly higher than students taught only by direct style.

The socioeconomic classification (SEC) levels when analysed, indicated that all student groups tested had higher achievement means when taught by indirect teacher style. Students in the low SEC group did significantly better on the language achievement test when taught by indirect style.

The development of the STORE Scale was an important dimension of the study. Horowitz (1979) and Silvernail (1979) have thoroughly reported a summary of findings which are believed to promote improved student achievement. The STORE Scale was constructed to determine the comparative levels of knowledge teachers have about these findings. It was assumed that knowledge of theory and practice of instruction, and as well their own classroom experience, would give teachers a sound background from which to respond to the items. It was for this reason it was called an 'opinionaire', as their knowledge and practice become professional opinion, regardless of research results.

In using the STORE a suspicion was confirmed, that those teachers who have more training in the practice and theory of instruction and/or learning, would rate higher than other teachers concerning knowledge of techniques that improve achievement. Pupil services teachers in the County of Strathcona, generally have one or more graduate courses in the field of educational psychology and/or special education. The other group which must also have graduate courses in the County of Strathcona generally, are school administrators. It was assumed that their courses do not generally deal with instruction, rather administration, that they would not be as successful on the STORE as other teachers. The assumption was found to be the case, as the group mean

for the pupil services teachers were the highest, with classroom teachers being second and school administrators having the lowest group mean.

The data also showed a difference, even though not significant, when teachers who used combinations of both direct and indirect teacher styles, they had the highest group mean on the STORE. The indirect instructional style group mean for teachers was found to be higher than for teachers rated as directive.

IMPLICATIONS

The findings reported by Fedigan and Gay (1979), which favoured direct instructional style with low SEC students, was not supported in this study. As previously mentioned, students taught by indirect teacher style consistently scored higher on achievement tests than students taught by direct style. Kratzmann, Byrne and Worth (1980) report that reducing class size to twenty students should be a goal of educators and school boards. This would be consistent with the findings of this study, as large groups of students in the classroom reduce the success of teachers trying to use indirect teacher style.

The issue of the importance of teacher-student interaction, in structures such as 'indirect instructional style', is supported by the following statement made by Kratzmann, Byrne and Worth (1980), in a report to the Alberta Government:

> In other words, we are again drawn to the critical core of what we term the "primacy of instruction" and the need to examine how many essential and effectve person- to-person interactions can feasibly occur and be directly supported within one classroom in a given period of time . . . . More time for positive motivation, resulting in higher self-esteem for individuals . . . (1980, p.27).

The concern focused by the Alberta Department of Education on student achievement should also involve the 'teaching style' in classrooms, and possibly 'learning style'. When a student completes the SPOTS Scale, no doubt his responses to items reflect an evaluation of how successful he felt his teacher was in classroom management. However, it must be noted, ratings completed by both students and teachers in the area of teacher style had agreement. Both rating systems, the SPOTS and the TSC, determined the student group which would be most successful on achievement tests. In each case it was the indirect teacher style group who scored higher.

The STORE Scale, or instruments similar, can help teachers focus on theory and practice that yield higher achievement gains for students. By using such an instrument to focus on instruction and achievement, teacher educators, school administrators and teacher groups could foster the beginnings of improving the process. The concept of examining instruction done by classroom teachers could be the basis of rejuvination for many teachers in their instructional practice. All inservice sessions concerning instruction, need an opener or focal point, and it would then follow that teachers who complete the STORE Scale could begin the process of examining and interacting with these teaching issues in

their own fashion. Workshops, staff meetings and professional development sessions could shoulder some of the involvement to the change process in education, referred to by the Alberta Minister of Education.

Other Possibilities For Research

Research involving large groups of students at all grade levels, would determine the respective strengths of teacher style as rated by instruments like the SPOTS and the TSC. The effect on student achievement by variables referred to by Silvernail (1979) is an area requiring further examination. Some of these variables involve the effect of praise, teacher style, motivation, school physical environment and student class size.

The STORE Scale could be used for large teacher groups as a tool to examine teacher understanding of the variables effecting student achievement, and as a facilitating device with inservice groups. The last point is reinforced by a recommendation made by a fact finding commission in a report on education to the Alberta Government. The report was made by Kratzmann, Byrne and Worth (1980) and they recommend :

> That teachers be encouraged to engage in forms of continuous professional development so as to maximize their contributions in planning and implementing instructional strategies under new working conditions . . . .In this regard, the Minister of Education, The

Honourable David King, was recently quoted in the Edmonton Journal as saying that teachers should explore the possibility of employing innovative instructional strategies as an outgrowth of technological developments which are of consequence to teaching and learning.(Kratzmann, Byrne and Worth, 1980, p.52)

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APPENDIX A

30- ITEM VERSION OF THE STORE

1. Students taught in a manner consistent with their achievement orientation (conforming or independent) will show greater achievement gains, than if the teacher does not consider this variable in lesson planning.

2. Teacher attitudes toward school and society affects student achievement.

3. Teachers who have taught in "open area" type schools, support the concept for use with the majority of students.

4. The social-emotional development of children is not affected by teaching style.

5. Students who think their teachers are directive tend to be higher achievers and demonstrate a preference for application.

6. Students who think their teachers are directive indicate a preference for activities and evaluations involving memory.

7. Students think that teachers of lower achieving groups care less for them than students in average or high achieving groups.

8. Teacher judgement of a schools educational effectiveness will not correlate highly with students' Canadian Test of Basic Skills results.

9. Student judgement of subject difficulty is positively correlated with achievement.

10. Teachers tend to show more indirect instructional style than direct style in the classroom.

11. Male teachers usually expect more explicit answers from male students than from female students.

12. Teachers exhibit greater directness with pupils of higher socio-economic status.

13. Teacher directness is associated with more questions on the part of students.

14. Higher achievement gains in language development are found when teachers use direct instructional style.

15. Teachers who are able to shift from direct to indirect instructional style and vice versa, tend to create situations where students show greater gain scores in achievement.

16. Teacher praise of student work accounts for very few student-teacher interactions, yet most teachers rate this as a worthwhile instructional activity.

17. Problem solving success is stimulated more by a direct rather than an indirect instructional style.

18. Elaborate praise is unrelated to student gains, but praise directly related to an academic achievement correlates highly (positively) with pupil progress.

19. Students who are accustomed to success, expect it, and those who are accustomed to failure expect failure.

20. There is no evidence to support the claim that a teacher should avoid telling a pupil that he is wrong. However, teachers who use criticism consistently tend to have classes which achieve less in most subject areas.

21. The use of pupil ideas in instruction will not result in student gain in achievement.

22. Students develop less positive attitudes toward school when student ideas are incorporated into learning activities.

23. Teachers who use oral questioning as a technique tend to find their classes have lower gain scores on achievement.

24. Encouraging a student to elaborate orally upon his response, or asking another question of the same student, is a technique which results in higher student gain scores on achievement tests.

25. Mixing factual questions with higher-order questions together throughout the instructional activity will not produce better student understanding.

26. Introductory comments, review and content-relevant motivational activity initiated by the teacher, as a general pattern of lesson construction will yield higher student achievement gains.

27. Classes of students who rate their teacher high on clarity of aims and of presentation, achieve more than classes who rate their teacher as low on these variables.

28. Group process skills can be achieved more effectively through group reward structures.

29. A positive relationship exists between cognitive learning and those classes students perceive as cohesive and satisfying.

30. Creativity is stimulated more by direct than indirect instructional style.

APPENDIX B

20- ITEM STORE SCALE

1. Creativity is stimulated more by direct than indirect instructional style.
2. A positive relationship exists between cognitive learning and those classes students perceive as cohesive and satifying.
3. Group process skills can be achieved more effectively through group reward structures.
4. Classes of students who rate their teacher high on clarity of aims and of presentation, achieve more than classes who rate their teacher as low on these variables.
5. Introductory comments, review and content-relevant motivational activity initiated by the teacher, as a general pattern of lesson construction will yield higher student achievement gains.
6. Mixing factual questions with high-order questions together throughout the instructional activity will not produce better student understanding.
7. Encouraging a student to elaborate orally upon his response, or asking another question of the same student, is a technique which results in higher student gain scores on achievement tests.
8. Teachers who use oral questioning as a technique tend to find their classes have lower gain scores on achievement tests.
9. Students develop less positive attitudes toward school when student ideas are incorporated into learning activities.
10. The use of pupil ideas in instruction will not result in student gain in achievement.
11. There is no evidence to support the claim that a teacher should avoid telling a pupil that he is wrong. However, teachers who use criticism consistently tend to have classes which achieve less in most subject areas.

12. Elaborate praise is unrelated to student gains, but praise directly related to an academic achievement correlates highly (positively) with pupil progress.
13. Problem solving success is stimulated more by a direct rather than an indirect instructional style.
14. Teachers who are able to shift from direct to indirect instructional style and vice versa, tend to create situations where students show greated gain scores in achievement.
15. Higher achievement gains in language are found when teachers use direct instructional style.
16. Direct teaching style is associated with more questions on the part of students.
17. Teachers exhibit more direct teacher style with pupils of high socioeconomic status.
18. Teachers tend to show more indirect instructional style than direct style in the classroom.
19. Students who think their teachers use a direct style indicate a preference for activities and evaluations involving memory.
20. Students who think their teachers use a direct teacher style, tend to be higher achievers and demonstrate a preference for application.

APPENDIX C

SCORING THE 20-ITEM STORE

Correct answers as reported in Silvernail (1979)

1. disagree
2. agree
3. agree
4. agree
5. agree
6. disagree
7. agree
8. disagree
9. disagree
10. disagree
11. agree
12. agree
13. disagree
14. agree
15. disagree
16. disagree
17. disagree
18. disagree
19. agree
20. disagree

BIOGRAPHY OF DARRELL SOUSTER

I am a Canadian, living and teaching in a suburb of Edmonton,Alberta called Sherwood Park. My family consists of two teenage daughters and my wife Joan, who is also a teacher. My position as assistant principal of the Glen Allan School seems to be an extremely busy one, as we are a large elementary school by Canadian standards, of just over six hundred students.

My physical education teaching major in my first degree from the University of Saskatchewan in Saskatoon, took me into a career of coaching and athletics. For seven years, I coached high school football and basketball.

I was encouraged by the Saskatoon Public School Board to become a vice principal, in 1967, when I was 26 years old. After a couple of years I realized I was more interested in psychology. I returned to the University of Saskatchewan and completed my Master of Education in Educational Psychology. I became a college counsellor at the Saskatchewan Institute of Applied Arts and Sciences in Saskatoon.

My next interest led me to move to Edmonton as a school psychologist. I became a Certified Psychologist in the Province of Alberta, and still have a private counselling practice. In 1975 I was hired by my current employer as they have channelled me into school administration.

In 1977, my coaching career was highlighted when I was fortunate to coach the Canadian Championship Junior Football "Edmonton Wildcats". We defeated the Hurricanes, of Hamilton, Ontario. This group of college aged athletes gave me great pleasure, but I can honestly say that watching my two daughters perform in the Alberta Dance Festival (where they have both been gold medalists in ballet), has been the highlight of my life so far.